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## **LAC MAUNOIR C-34 FINAL COMPLETION WELL REPORT**

Note: This completion report was generated at the request of the NEB and is a more detailed version of the Completion Section of the Final Well Report previously submitted for the C-34 well.

**APACHE CANADA LTD.**

**APACHE PARAMOUNT LAC MAUNOIR C-34**

**Grid Area 67 DEG. 20 MIN/ 125 DEG. 00 MIN**

**DATE: May 19, 2005**

**COMPANY REPRESENTATIVE: Greg D. Hladun**

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## A. INTRODUCTION

Apache Canada Ltd. In partnership with Paramount Resources Ltd drilled a 945 meter exploratory well spudded on January 20, 2004 and rig released on February 23, 2004 to evaluate gas potential in the Mt. Clarke formation at a depth of 891 to 945 m KB.

The well is located approximately 80km north east of Colville Lake. The exact co-ordinates of the well in NAD 27 are as follows:

Latitude: 67 deg 13 ', 02.171 "  
Longitude: 125 deg, 06 ', 56.649 ".

The well was cased and the drilling rig was moved off. The Nabors 203 service rig was moved onto the location March 9, 2004. While entering the wellbore it was noticed the wellbore was prone to freezing problems as deep at 141m, as the bottom hole temperature was only 7deg C. The Lower Mount Clarke "C" formation was perforated at 902.5 – 905.5 m KB. The interval was washed with frac oil and broken down. It was swabbed dry and then a permanent bridge plug was set above it at 926.7 m KB. The Upper Mount Clarke "C" formation was then perforated at 891.0 – 894.0 m KB. The zone was hydraulically fractured and then was swabbed. The zone flowed burnable gas at rates TSTM. The tubing was released from the packer and sand was dumped on top of the packer. The Mount Clarke "B" zone was perforated at 876.6 – 879.5 m KB. The well was frac'd and cleaned up. A bottom hole assembly with two packers and a sliding sleeve was run such that the Upper Mount Clarke "C" could produce from below the lower packer and the Mount Clarke "B" could produce through the sliding sleeve. The Lower Mount Clare "C" zone was swabbed and produced 38 API oil at about 1.5 m3/hr. Total oil swabbed was 40.7 m3 frac oil and 30.8 m3 formation oil. Total water was 9.1 m3. The zone was suspended with a pug and the sliding sleeve was opened. The produced oil was injected into the Mount Clarke B zone. The sliding sleeve was closed. Recorders were run and then later retrieved by helicopter. The well was left with a plug downhole and a plug in the tubing below the wellhead.

## B. GENERAL DATA

1. Well Name: Apache Paramount Lac Maunoir C-34

Authority to Drill a Well No: 1955

Exploration Agreement Number: Sahtu Settlement Lands Block C-34

Location : Unit: C Section: 34

Grid Area: 67 deg 20' 125 deg 00 '

Classification: Exploration

2. Well Location Area: Lac Maunoir  
Coordinates (NAD 27): Latitude: 67 deg 13' 02.171"  
Longitude: 125 deg 06' 56.649 "
3. Unique Well Identifier: 300C346720125000
4. Operator: Apache Canada Ltd.
5. Completions Rig Contractor: Nabors
6. Service Rig # 203
7. Total Completion Cost - \$2,732,744
8. Support Craft: Trucking via Winter Road from Norman Wells / Fort Good Hope

#### C. SUMMARY OF COMPLETION OPERATIONS

1. Elevations:  
Ground 622.8 m above sea level  
KB: 628.0 m above sea level  
KB To Casing Flange: 4.8 m
2. Total Depth:  
FTD: 945.0 m KB  
PBTD: 926.7 m KB  
TVD: 944.32 m KB
3. Perforated Depth  
Lower Mount Clark "C" 902.5 - 905.5 m KB  
Upper Mount Clark "C" 891.0 - 894.0 m KB  
Mount Clark "B" 876.5 - 879.5 m KB
4. Date and Hour Spudded: Jan 20, 2004, 11:00 hrs
5. Date Drilling Completed: Feb 20, 2004, 09:30 hrs

6. Date of Rig Release: February 23, 2004, 24:00 hrs

7. Well status: Completed and Suspended

8. Hole Sizes and Depths:

Conductor Hole: 444.5 mm to 61 m KB

Surface Hole: 311 mm to 451.0 m KB

Main Hole: 216 mm to 945.0 m KB

9. Casing and Cementing Record:

Conductor Hole: 444.5mm

Casing Size: 339.7 mm

Casing Weight: 101kg/m

Casing Grade: K-55

Casing Make: Ipsco

Number of Joints: 5

Thread: BT&C

Depth Set: 61 m (KB)

Cut Height: At Surface

Cut off Depth: At Surface

Date Set: February 4, 2004

Cement Volume: 10Tonnes

Cement Type: Artic Set

Additives: 2.0 % CaCl2

Surface Hole: 311.0mm

Casing Size: 244.5 mm

Casing Weight: 59.53 kg/m

Casing Grade: L-80

Casing Make: Ipsco

Number of Joints: 32

Thread: LT&C

Depth Set: 451.0 m (KB)

Cut Height: At Surface

Date Set: Feb 15, 2004

Cement Volume: 16 m3

Float Shoe Depth: 451.0 m

Cut Off Depth: Surface

Cement Type: 3.0 m3 Arctic Set Cement followed by 12.8 m3  
Class G cement

Additives: Arctic Set  
0.5% D-56 TIC

0.2% D-13  
Class G  
2.0% CaCl2

Cement Top: Surface (m KB )  
Casing Bowl Size: 279 mm X 244.5 mm X 21 MPa  
Casing Bowl Make: Cameron Type 'IC-2' Slip Lock

Production Hole: 216.0mm  
Casing Size: 178.0 mm  
Casing Weight: 43.16 kg/m  
Casing Grade: L-80  
Casing Make: Ipsco  
Number of Joints: 78  
Thread: LT&C  
Depth Set: 945.0 m (KB)  
Cut Height: At Surface  
Date Set: Feb 23, 2004  
Cement Volume: 15.9 m3  
Float Shoe Depth: 945.0 m  
Float Collar Depth: (Top) 933.9  
Cut Off Depth: Surface  
Cement Type: 18.1m3 Class "G"  
Additives:  
0.2% D-046  
0.5% D-065  
0.3% D-167  
Cement Top: Surface

10. Tubing Head Details:

A 279.4 mm x 244.5 mm, 21,000 kPa Cameron slip lock casing bowl is locked down onto the 244.5 mm casing. A string of 178 mm casing is packed off in the casing bowl. On top of the casing bowl is a 279.4 mm, 21 MPa x 179.4 mm, 21 MPa Cameron tubing head, serial number 110093062-9. A set of secondary seals packs off the 178 mm casing against the base of the tubing head. The Christmas trees consists of two 65 mm 34,500 kPa valves. The side outlet on the tubing head is 52 mm, 34,500 kPa.

11. Time Distribution:

| <b>Nohga C-34</b> |                   |  |
|-------------------|-------------------|--|
| Date              | Time              | Activity   |
| March 9, 2004     | 07:00-20:30       | Started moving Nabors 203 service rig to C-34 from Nogha area. Headed up Cameron 279.4 mm x 179.4 mm tubing head and BOP's.  |
| March 10          | 7:00-24:00 hrs    | Rigged up rig and BOP's. Rigged in Schlumberger wireline. Ran gauge ring. Could not get past 38.5 m. Rigged out Schlumberger.  |
| March 11          | 24:00 – 7:00 hrs  | Picked up tubing. Ran in with bit and scraper. Tagged at 38.5 m.   |
| March 11          | 7:00 – 19:00 hrs  | Rigged in hot oiler and circulated hot water down tubing. Worked pipe and eventually ran in hole with 152.4 mm bit and scraper to 126 m.   |
| March 12          | 7:00 – 24:00 hrs  | Wait on swivel. Rigged in swivel. Pulled out with bit and scraper.   |
| March 13          | 24:00 – 07:00 hrs | Drilled from 126 m to 268 m.   |
| March 13          | 7:00 – 19:00      | Drilled to 270 m. Fell through. Ran in to 927.0 m. Pulled out with bit. Ran in hole with tubing and scraper.   |
| March 14          | 7:00 – 24:00 hrs  | Waited on loggers.   |
| March 15          | 7:00 - 15:00 hrs  | Waited on loggers.   |
| March 15          | 15:00 – 24:00     | Ran Schlumberger GR/CBL Log. Waited on VSP personnel and equipment.  |
| March 16          | 24:00 – 7:00      | Conducted VSP. Started running tubing in hole.   |
| March 16          | 7:00 – 24:00      | Finish running tubing to T.D. Displaced casing to N2. Pulled out tubing. Pressured casing to 4.0 MPa with N2. Ran in with 3.0 m x 127 mm ERHSC gun loaded at 17 spm, 39 gram DP charges with 60 degree phasing . Perforated the Lower Mount Clark "C" 902.5 – 905.5 m KB interval. Ran in hole with packer to wash interval with frac oil and N2. Unable to get packer past 139.2 m. Pulled out of hole and found packer and pup joint covered in ice. Heated packer. Ran in but could not get past 141.7 m. Pulled out. Packer covered in ice. Ran in with on/off tool and overshot. Landed tubing . Rigged to swab. Could not get past 5 m with cup. Ran in with knuckle to 700m. Poured 60 liters of methanol down tubing. Ran to 850 m. Pulled out. Dry swab. Pulled out tubing. |
| March 17          | 24:00 – 7:00      | Ran in with BHA and 73 mm tubing. Tubing bottom at 902 m. Pumped frac oil at 0.15 m3/min and N2 at 10 m3/min. Pumped 9.6 tonnes 20/40 sand in Rimbey Platinum frac oil. Broke down formation at 16.5 MPa. Pressure dropped to 10 MPa. Increased N2 to 20 m3/min. Final pressure of 13 MPa  |

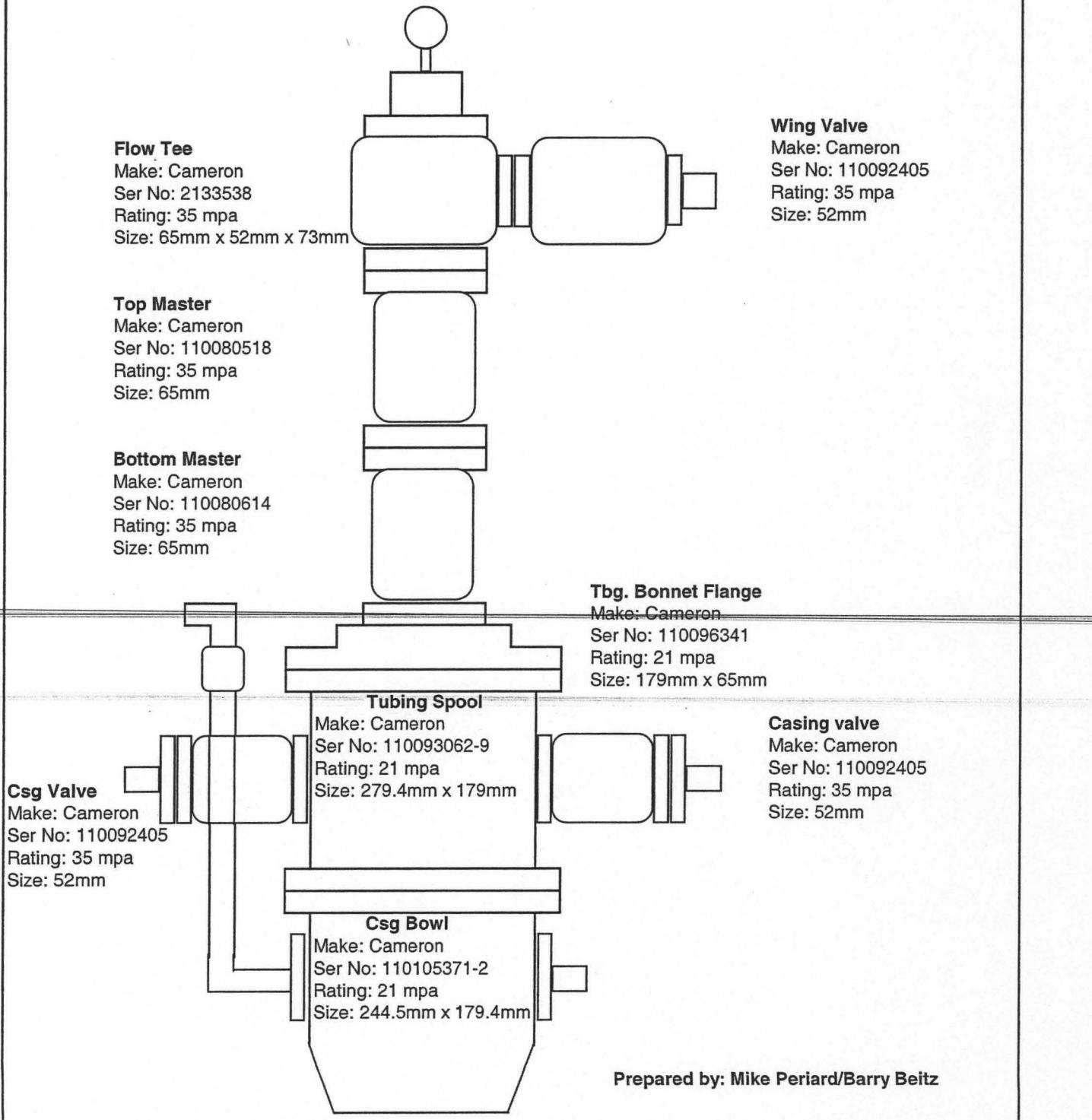
|          |                   |  |
|----------|-------------------|--|
|          |                   | on surface. Rigged down oiler and N2.  |
| March 18 | 7:00 – 19:00 hrs  | Rigged in testers, SITP = 9923 kPa. Opened well. Well bled off immediately. Shut in well. Built from 18 kPa to 36 kPa in 15 min. Rigged in swab equipment. Pulled swab from 870 m. No fluid. Rigged out wireline. Unset packer and tripped out. Rigged in wireline and set permanent bridge plug at 901.0 m. Ran in hole with 3.0 m, 127 mm ERHSC gun loaded @17 spm, 39 gram DP charges with 60 degree phasing. Pressured annulus to 4.0 MPa with N2. Perforated Upper Mount clark C interval 891.0 – 894.0 m KB. No change in pressure. Pulled out of hole. Made up re-entry guide, Halliburton Versa set packer and tailpipe. Tubing bottom at 889.5 m KB Rigged up wellhead isolation tool. Pressured up on annulus with N2 to 7000 kPa. Rigged in Halliburton frac equipment. Performed minifrac, then main frac. Maximum pressure 22 MPa, breakdown to 16.6 MPa. ISIP 5.5 MPa ,after 15 minutes 1.2 MPa. Job finished at 2130 hrs. |
| March 19 | 00:30-07:00 hrs   | Opened well to testers. No flow to vessel. Ran in CTU and blow well with N2. Recovered 1.8 m3 gelled fluid and small amount of sand. Total fluid recovered 8.4 m3 oil. Rigged out coiled tubing, SITP 750 kPa.   |
| March 19 | 07:00 – 24:00 hrs | Ran plug in tailpipe. Released from packer and pulled out of hole with tubing and overshot. Dump bailed sand on packer. Ran in with 3.0 m, 127 mm ERHSC gun loaded with 17 spm, 39gr DP charges with 60 degree phasing . Pressured casing to 3.7 MPa with N2. Perforated Mount Clark B at 876.5 – 879.5 m KB. No change in pressure. Bled off casing. Made up overshot, packer and tailpipe. Rigged up frac equipment. Pressured annulus to 7.0 MPa with N2. Mini frac'd well then did Main frac. Pumped 8.3 tonnes 20/40 sand in Rimbey Platinum frac oil. Maximum pressure 15.9 MPa. Breakdown 15 to 7.3 Mpa. ISIP 1.9 MPa. 15 min shut-in 0.5 MPa. Frac completed at 21 hrs. Placed 8.2 tonnes sand.  |
| March 20 | 24:00 -07:00 hrs  | Ran in with coiled tubing. Recovered 7.5 m3 frac oil. Burnable gas but TSTM. Released packer. Tagged fill at 884.2 m. Re-set packer with tubing bottom at 883.0 m.   |
| March 20 | 07:00 - 24:00 hrs | Ran coiled tubing but plugged off coil while pumping used frac oil. Tried to set plug in RN nipple but unable to set. Set a collar stop and G-pack plug at 53 m. Bled off tubing. Rigged up snubbers. Pulled above perfs. Set packer.  |
| March 21 | 24:00 – 7:00 hrs  | Installed wellhead . Pulled plug. Opened well to testers at No flow. Swab well. Pulled swab from 120 m. Well started to flow. Recovered 3.1 m3 frac oil.   |
| March 21 | 07:00- 07:00 hrs  | Continued to swab/flow well. Recovered 40.7 m3 frac oil.   |

|                |                   |   |
|----------------|-------------------|---|
|                |                   | 3.97 m3 new fluid. Salinity 8.2%. PH 7 API 43. Traces of sand.  |
| March 22       | 07:00 – 18:00 hrs | Swabbed/flowed well. Recovered another 4.4 m3 fluid. 15% to 25% water cut. Total oil recovered 71.61 m3. API 39.5 at 12 deg C. Shut in well at 14:45 and recorded build ups. Well built to 569 kPa after 3 hours.   |
| March 23       | 07:00-19:00 hrs   | Rig Repairs.  |
| March 24       | 07:00 – 24:00 hrs | Waited on parts for jack shaft. Installed new bearing. Rigged in slickline to pull recorders. Took gradient. Bled tubing to zero.   |
| March 25       | 24:00-7:00        | Pumped 3.25 m3 oil down tubing. Removed wellhead. Installed BOP's. Released packer . Pulled out of hole.  |
| March 25       | 07:00 – 07:00     | Tripped out of hole. Reverse circulated sand off packer at 885.7 m. Ran On-off connector and connected to Versaset packer with sliding sleeve above and Uni VI packer above sliding sleeve. See bottom hole diagram for final assembly. Ran in and set recorders in RN nipple at 888.88 m. Rigged up to swab and evaluate upper Mount Clark C. Pulled 3 swabs recover 4.0 m3 oil, 0.45 m3 water, PH – 8. Salinity over 28%. |
| March 26       | 07:00 – 7:00      | Pulled 42 swabs. Recovered 26.7 m3 oil, 5.2 m3 water.   |
| March 27       | 07:00 – 7:00      | Pulled 51 swabs. Recovered 30.7 m3 oil, 3.0 m3 water.   |
| March 28, 2005 | 07:00 – 07:00     | Pulled 20 swabs. Recovered 10.5 m2 oil, 0.5 m3 water. Rigged out swab equipment. Ran plug in X nipple at 853.2 m KB. Filled tubing with oil. Opened sleeve. Pumped 75.5 m3 of oil into Mount Clark "B" zone. Shut Sleeve. Pulled plug from X nipple. Ran recorders. Total recovery 40.7 m3 frac oil, 30.8 m3 formation oil, 9.11 m3 water.  |
| May 16, 2005   |                   | Pulled recorders from R nipple at 884.66 m KB. BHP = 6431 kPa. BHT = 7.4 deg C. Set plug and prong in 55.58 mm RN nipple at 888.88 m KB. Set Camco A-3 plug and slip stop at 19 m CF. Moved off.  |

12. Completion Record:

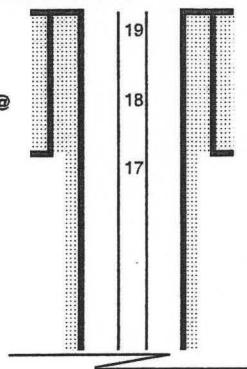
Start Date: March 9, 2004  
 Finish Date: March 28, 2004  
 Contractor: Nabors

Wellhead Diagram and Final Well Configuration: See attached Diagram



APACHE CANADA LTD.  
 WELL DIAGRAM "Final"

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 Surf. Csg. @  
 451.0


|                                       |                  |                      |              |                       |
|---------------------------------------|------------------|----------------------|--------------|-----------------------|
| WELL NAME: Apache Maunoir C-34        |                  |                      |              |                       |
| PREPARED BY: Mike Periard/Barry Beitz |                  |                      | DATE:        | 2004-05-16            |
| ELEVATIONS (meters):                  |                  |                      | Licence No:  | WID 1995              |
| TD                                    | 945.00           | KB Elev.             | 628.00       | KB to CF Dist. H 4.70 |
| PBTD                                  | 926.70           | Ground Elev.         | 622.80       | KB to Ground 5.20     |
| <b>CASING/TUBING</b>                  | <b>SIZE (mm)</b> | <b>WEIGHT (Kg/m)</b> | <b>GRADE</b> | <b>DEPTHS (m)</b>     |
| Surface Casing                        | 244.50           | 53.50                | J-55         | 451.00 32 Jts         |
|                                       |                  |                      | LT&C         |                       |
| Production Casing                     | 177.80           | 43.16                | L-80         | 945.00 78 Jts         |
|                                       |                  |                      | LT&C         |                       |
| Prod Liner                            |                  |                      |              |                       |
| Tubing                                | 73.00            | 9.67                 | L-80         | 889.53 90 Jts         |
|                                       |                  |                      | EUE          |                       |

## BOTTOM HOLE ASSEMBLY:

| ITEM | DESCRIPTION   | LENGTH (m) | Top at (m KB) |
|------|---|------------|---------------|
| 1    | 1 - 73 mm Re-entry guide  | 0.15       | 889.38        |
| 2    | 1 - 73 mm x 55.58 mm "RN" nipple c/w 51.05 mm No-Go                       | 0.50       | 888.88        |
| 3    | 1 - 73 mm EUE 9.67 kg/m L-80 pup joint                                    | 1.25       | 887.63        |
| 4    | 177.8 mm x 73 mm Halliburton Versaset DGP packer                          | 1.90       | 885.73        |
| 5    | 139.7mm Halliburton XXLHD J-less on/off assembly c/w 55.58 mm "R" profile | 1.07       | 884.66        |
| 6    | 1 - 73 mm EUE 9.67 kg/m L-80 pup joint                                    | 3.08       | 881.58        |
| 7    | 1 - 73 mm Halliburton XA sliding sleeve c/w 58.75 mm X profile            | 1.12       | 880.46        |
| 8    | 1 - 73 mm EUE 9.67 kg/m L-80 pup joint                                    | 2.47       | 877.99        |
| 9    | 1 - 73 mm x 58.75 mm X nipple   | 0.37       | 877.62        |
| 10   | 1 - 73 mm EUE 9.67 kg/m L-80 pup joint                                    | 2.47       | 875.15        |
| 11   | 2 - 73 mm EUE 9.67 kg/m, L-80 tubing joints                               | 19.23      | 855.92        |
| 12   | 177.8 mm x 73 mm Halliburton UNI VI DGP packer                            | 2.01       | 853.91        |
| 13   | 177.8 mm XL-HD on/off assembly c/w 58.75 mm X profile                     | 0.67       | 853.24        |
| 14   | 1 - 73 mm EUE 9.67 kg/m L-80 pup joint                                    | 3.08       | 850.16        |
| 15   | 1 - 73 mm x 58.75 mm X nipple <b>plug in place</b>                        | 0.37       | 849.79        |
| 16   | 87 - 73 mm EUE 9.67 kg/m, L-80 tubing joints                              | 834.73     | 15.06         |
| 17   | 1- 73mm, 9.67 kg/m, L-80 nipple   | 0.34       | 14.72         |
| 18   | 1- 73mm, 9.67 kg/m, L-80 tubing joint                                     | 9.55       | 5.17          |
|      | Compression of 3500 daN   | -0.24      | 5.41          |
|      | Log Correction  | 1.00       | 4.41          |
| 19   | 179.4 mm x 73 mm Cameron extended neck chemical line prep tbg. Hngr       | 0.26       | 4.15          |
|      |   |            | 4.15          |

 Mount Clark "B"  
 876.5-879.5

 Perm. B.P. @  
 901.0 m

 PBTD @  
 926.7 mkb  
 Prod Csg @  
 945.0

TD @ 945.0 m

 U. Mount Clark "C"  
 891.0 - 894.0

 L. Mount Clark "C"  
 902.5-905.5

|  |  |
|--|--|
| <b>PERFORATION INTERVALS</b>   |  |
| 876.5-879.5 mKB- Mount Clark "B"   |  |
| 891.0 - 894.0 mKB - Upper Mount Clark "C"  |  |
| 902.5 - 905.5 mKB - Lower Mount Clark "C" ( Abandoned under Bolt 10K permanent bridge plug ) |  |

|   |  |
|---|--|
| <b>NOTE:</b>  |  |
| Ran a 139.7 mm overshot on top of bottom packer due to sand |  |